



[Home](#) › [Methodologies](#) › [Weekly Payroll Jobs methodology](#) › Week ending 22 May 2021



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# Weekly Payroll Jobs and Wages in Australia methodology

Reference period Week ending 22 May 2021

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Released 9/06/2021

## On this page

[How data are collected](#)

[How data are processed](#)

[How data are released](#)

[Methods review](#)

[Data limitations and revisions](#)

[Differences to labour force employment statistics](#)

[History of change](#)

[Glossary](#)

[Abbreviations](#)

The following sections have been updated in this release:

- How data are collected: Scope and coverage
- Data limitations and revisions: Seasonality

## How data are collected

### Source

The Australian Taxation Office (ATO) receives payroll information from businesses with Single Touch Payroll (STP) enabled payroll and accounting software each time the business runs its payroll. The ATO provides selected business and job level data items from the STP system to the ABS for the production of statistics.

## **Scope and coverage**

The scope and coverage of these estimates are largely defined and constrained by the characteristics of the data sources from which these estimates are produced. As such, users should note that not all jobs and wages in the Australian labour market are captured within these estimates.

### **Payroll jobs**

Payroll jobs as reported to the ATO through STP are in scope of these estimates. All payroll jobholders regardless of age or Australian residency status are included. Persons reported via STP must hold either a Tax File Number (TFN) or an Australian Business Number (ABN).

A payroll job is a relationship between an employee and their employing enterprise, where the employee is paid in the reference week through STP-enabled payroll or accounting software and reported to the ATO. Where an employee is paid other than weekly, the established payment pattern is used to include payroll jobs paid in weeks outside the reference week.

Payroll jobs reported via STP exclude owner managers of unincorporated enterprises.

Employers with 20 or more employees (large employers) commenced transition to STP reporting on 1 July 2018. At the time of this release, almost all large employers are reporting through STP.

Employers with less than 20 employees (small employers) began transitioning to STP on 1 July 2019. The ATO has made reporting concessions available for small employers where they:

- employ family members or other 'closely held' payees,
- are micro employers with one to four employees,
- employ intermittent or seasonal workers, or
- don't have access to a reliable internet connection.

Reporting concessions are due to end on 30 June 2021. At the time of this release, over 75% of small employers are reporting through STP.

In addition, payroll jobs reported in the Defence Industry (ANZSIC Class 7600) are excluded from these estimates by the ABS to better align with other [Labour estimates](#)

<https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/6150.0~Oct%202019~Main%20Features~Australian%20Labour%20Account%20Concepts~4>

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## Wages

The STP reported wages associated with each payroll job are in scope of these estimates.

Wages are gross amounts, prior to taxation and deductions and include:

- salary payments and allowances,
- labour hire payments and foreign income,
- the value of payments in kind (where a fringe benefit amount is recorded),
- bonuses where they are reported in the same field as normal payments.

The total wages concept broadly aligns with the [Australian System of National Accounts](https://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/5216.0Glossary12015?OpenDocument) (ASNA) definition of wages and salaries, with the exception of payments to employee's superannuation and severance and termination payments which are excluded.

More specifically, the following STP reported income items are included in the production of wages estimates;

- gross income amount (including bonuses),
- allowance income,
- fringe benefit amount (reportable, taxable),
- fringe benefit amount (reportable, tax exempt),
- other income (not specified),
- foreign income amount including tax exempt income,
- Community Development Employment Project income.

## Other data sources

The STP data are enhanced through combining other administrative data held by the ABS (also sourced from the Australian taxation system).

Sex, age and geographic variables are primarily sourced from Client Register data (supplied by ATO to the ABS as part of the transfer of Personal Income Tax data). Sex can only be sourced from Client Register data. When age and geography are not available from Client Register data, they are sourced from STP data. Jobholders whose characteristics cannot be linked or derived (from either Client Register or STP data) are assigned an 'unknown' category for that characteristic. For more information, see the Data components, totals and index calculation section of [Data limitations and revisions \(/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-22-may-2021#data-limitations-and-](#)

[revisions](#)).

Industry of activity and employment size variables of the employing business are sourced from the ABS Business Register.

Further detail on the ATO Client Register and ABS Business Register are included below.

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## ATO Client Register

The ATO Client Register is a register of persons that have interacted with the ATO and have been issued with an Australian Tax File Number (TFN). The person-level Client Register contains demographic data such as sex, date of birth and residential address. The ABS receives yearly updates (or snapshots) of the de-identified Client Register from the ATO for use in the production of statistics.

Jobholder characteristics were initially sourced from the mid-2019 snapshot. From the 13 April 2021 release, jobholder characteristics such as date of birth (from which age is derived), sex and geography (including sub-state region) have been updated using the mid-2020 snapshot. These characteristics are held constant over the time series to reduce volatility in fluctuating characteristics.

While date of birth is held constant, the age of jobholders (as derived from date of birth) continues to be updated at the start of a jobholder's birth month each year.

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## ABS Business Register

The ABS Business Register is populated using data from the Australian Business Register (ABR) and business data from the Australian Tax Office (ATO). Data on the structures of large and complex businesses are also collected by ABS. The ABS Business Register is updated regularly and a frame of business, containing business characteristic information, is produced quarterly for use in the production of statistics.

The March 2020 quarter frame (or snapshot) is currently used to determine industry and employment size for businesses reporting their payroll via STP in these estimates. Once a business' payroll job is allocated to an industry or employment size, it is held constant against that category over time. By using the March 2020 snapshot and holding employer characteristics constant, the ABS is able to present information about the change in payroll jobs based on the employer characteristics before Australia recorded its 100th confirmed COVID-19 case on 14 March 2020.

Businesses which were created after March 2020 will not appear on the snapshot and are assigned an 'unknown' employment size and industry. The number of STP Payroll jobs which

do not have employment size or industry is small, and their exclusion is expected to have minimal impact on the industry and employment size estimates. An update of the Business Register snapshot will be undertaken over the next few months. For more information, see the Data components, totals and index calculation section of [Data limitations and revisions \(/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-22-may-2021#data-limitations-and-revisions\)](https://methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-22-may-2021#data-limitations-and-revisions).

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## How data are processed

To produce estimates from STP data, a number of processes and treatments are applied.

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### Calendarisation

The STP data are reported on a cash basis (the time when the payment was made) rather than an accrual basis (the time when the payment was earned). Production of real time estimates require the conversion of STP data from a cash basis to an accrual basis. This is done through a “calendarisation” method. This method breaks down all records to a common period (daily), which allows the data to be aggregated and analysed for any longer period (e.g. weekly).

The calendarisation method includes the following steps:

- calculation of the periodicity (payment frequency) using the start and end date of the payment period,
- calculation of a daily pay rate by dividing the total payments by the payment frequency (for example, weekly pay is divided by seven), and
- an adjustment to the periodicity for a job to exclude the days before commencement (or after termination), where the start or termination date for a job occurs within the payment period.

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### Accrual of end of financial year payments

Towards the end of the financial year, unadjusted STP data includes higher than usual week-to-week changes in total wages paid. In particular, some employers report lumped fringe benefits tax (FBT) payment amounts for eligible employees at the end of the financial year. This is most evident in the Health care and social assistance industry. In order to reduce the reporting variability introduced by these payments, the ABS has determined and applied an adjustment factor to accrue reported FBT amounts across the relevant financial year wages series. It is applied to all records which include reportable FBT amounts, not just those in the Health care and social assistance industry.

This adjustment factor has been applied for the 2020-21 financial year, but will be revised at the conclusion of each financial year using business reported data to ensure it remains current. This treatment enhances the existing calendarisation methodology and is consistent with the definition of wages and salaries used in the Australian System of National Accounts. More information about employer reporting of FBT is available from the ATO website.

This adjustment methodology is not possible for other extraordinary payments (such as bonuses) where they are included with the wages data in the period they are paid. Bonuses are not currently readily distinguishable from the wages component of the STP job level dataset (unlike reportable FBT amounts) and can be paid at any time.

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## Imputation

In addition to cash reporting, extracted STP payment data for a specific week cycle may be incomplete due to:

- different business reporting habits;
- different pay frequencies; and
- the 17-day lag between the reference week and the release of estimates.

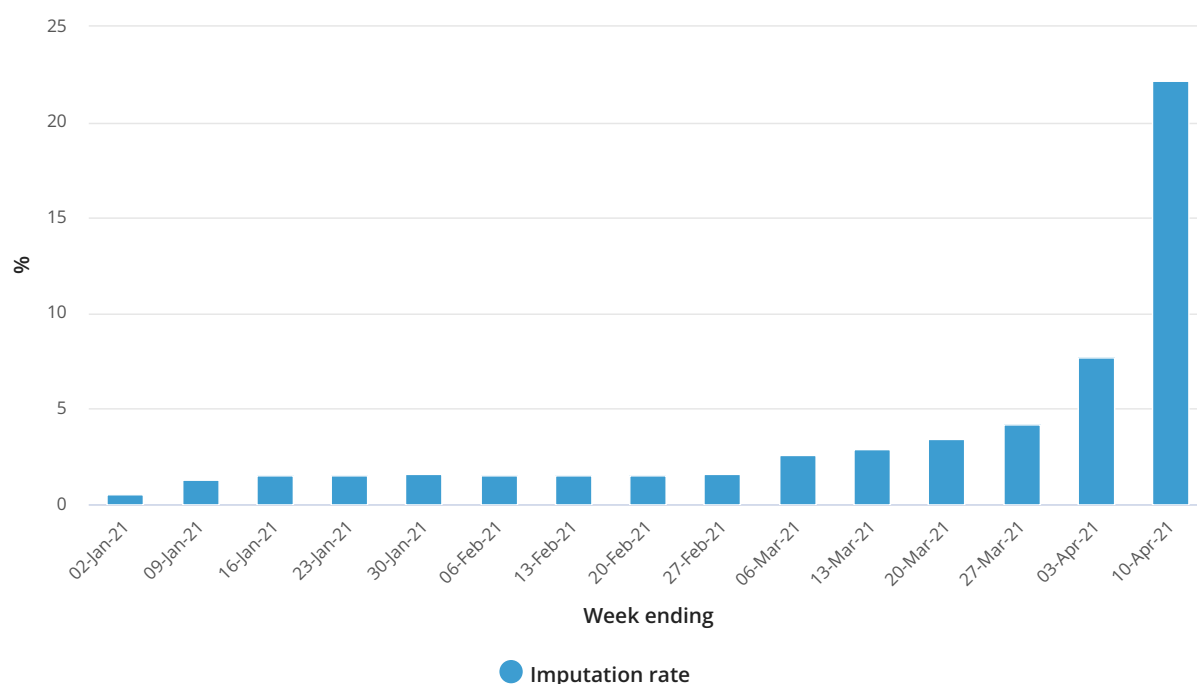
To produce reliable weekly statistics, an imputation method is applied to account for incompleteness. Imputation includes the following considerations:

- Imputation is not applied where no established pattern of payment exists to enable forward extrapolation. For example, a small proportion of employees paid on an ad hoc basis.
- If an employee has not yet had payment data reported and they have not been flagged for termination, it is assumed that their payment status is consistent with their previous reporting record. The previous calculated daily rate will be imputed for the current period.
- If an employee has no payment data reported for two consecutive pay periods, it is assumed that their employment has been terminated. No further forward imputation is applied. Imputed data remains in place until eight pay periods have elapsed, to account for any lags in business reporting.
- No imputation is applied for new employees without historical payment information, until a pattern can be determined. This means that there is an inherent and unavoidable lag before new payroll jobs appear in the data after their initial pay period. The lag is longer for new jobs with employers who have less frequent payment and reporting periods, which is accounted for via a coverage adjustment.

Analysis indicates that STP data for the most recent reference week at the time of initial publication is approximately 75-80% complete and can take several months to be fully

complete (due to quarterly STP reporters). The delay in 'completeness' is observed via the level of imputation over time.

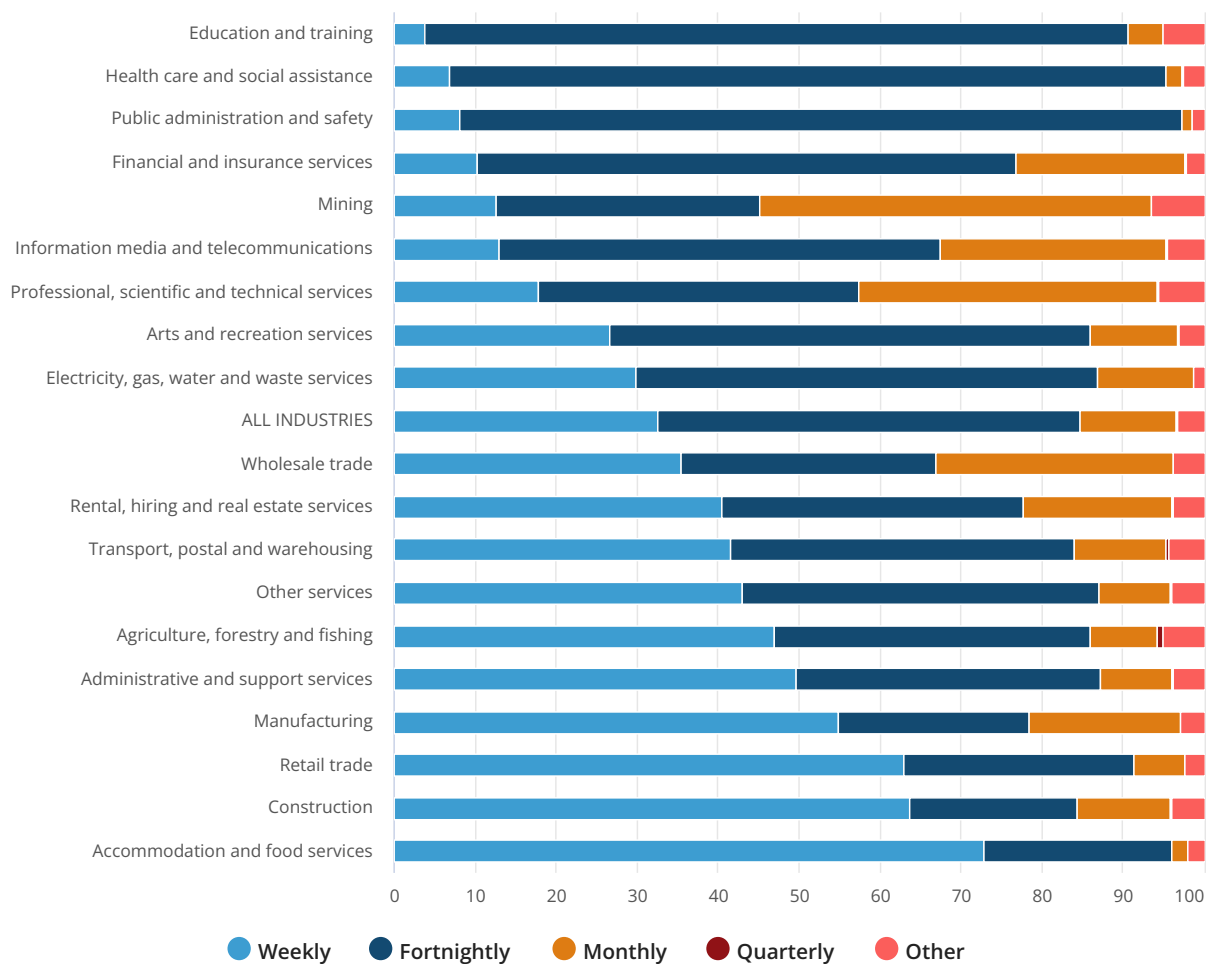
Graph 1 - Imputation rate by week ending as at 28 April 2021 release



In any given reference week, business reported data is included for almost all weekly paid employees, most employees paid fortnightly and some employees paid monthly. For example, a business with a fortnightly payroll will only report payments in alternate weeks in the STP dataset. As at the end of March 2021, the data indicated that 33% of employees are paid weekly; 52% are paid fortnightly; 12% are paid monthly; and 3% are paid quarterly or infrequently.

While a fortnightly pay frequency is the most common amongst all industries, the dominant pay frequency varies across industry as seen in the graph below. This may affect the level of imputation in each industry.

Graph 2 - Proportion of reported pay frequency by industry



Ranked by ascending weekly pay frequency, for the week ending 27 March 2021.

The imputation method was updated in the week ending 30 January 2021 release. For more information, see the Imputation update subsection of [Methods review \(/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-22-may-2021#methods-review\)](#).

## Aggregation



Once STP data are converted via the calendarisation method and imputation is applied, the data are aggregated for each week (ending Saturday) to produce:

- total payroll jobs, which is the average of the 7 days of payroll job counts,
- total wages, which is the sum of all daily wages for the week, except for employees who cease a job during the week where only the wages for the days worked are included, and
- average weekly wage per payroll job, which is calculated by dividing the total wages value by the total payroll jobs number.

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## Suppression

To protect the confidentiality of individuals, data are subject to a suppression process. Data suppression is generally applied to finer level estimates, where a smaller number of individuals contribute to the estimate (such as sub-state indexes). The existing data suppression process has recently been reviewed and updated, and applied to estimates since the release on 20 October 2020. This has resulted in an improvement in the quality of the underlying data used to produce the sub-state datacube. Previously released national, state and territory and industry indexes were not changed by this updated process.

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## Creation of indexes

Estimates are supplied as indexes to provide an indication of movements (rather than level estimates) during the COVID-19 period. In order to compare changes over time, the week in which Australia recorded its 100th confirmed coronavirus case (i.e. the week ending 14 March 2020) is used as the reference period for constructing the indexes and given an index value of 100.0. These indexes differ from the ABS' suite of price indexes (including the Wage Price Index) which measure changes in price over time unaffected by quality or quantity and should not be directly compared.

Indexes allow comparison of data between two points in time, the points in time can be adjacent (this week and the previous week) or many weeks apart. Movements in the index from one period to another can be expressed as either points or percentage change and these are rounded to one decimal place. The following example illustrates the method of calculating changes in index points and percentage changes between any two periods:

|   | Index number                  |
|---|-------------------------------|
| Week ending 06 February 2021 for SA4: Melbourne - Inner     | 98.4                          |
| Less week ending 09 January 2021 for SA4: Melbourne - Inner | 94.4                          |
| Change in index points                                      | 3.8                           |
| Percentage change   | $3.8/94.4 \times 100 = 4.0\%$ |

The following example illustrates the method of calculating a recovery percentage change between any two periods:

|  | Index number                  |
|--|-------------------------------|
| National payroll jobs index for week ending 14 March 2020      | 100                           |
| Less National payroll jobs index for week ending 18 April 2020 | 91.6                          |
| Payroll jobs lost from 14 March index value (denominator)      | 8.4                           |
| National payroll jobs for week ending 23 January 2021          | 99.7                          |
| Less National payroll jobs index for week ending 18 April 2020 | 91.6                          |
| Recovery index points (numerator)                              | 8.1                           |
| Recovery percentage change                                     | $8.1/8.4 \times 100 = 96.4\%$ |

These estimates are also affected by the dynamic nature and source of data. The impact on accuracy and coherence with other ABS labour statistics are described below.

## Accuracy

STP is a dynamic administrative data source, hence these estimates may be subject to the following sources of error:

- Conceptual misalignment - The Australian tax system is purpose-built and complex, and in some cases it is difficult to determine how a particular STP item should be used to describe impact on payroll jobs and wages. While all care is taken, some income items are subject to this type of validity error. Coherence with other sources indicates that this has a low impact on the aggregate series.
- Reporting error - This is likely to be present in both person and business information used. Most reporting errors are unable to be determined or corrected; however, coherence with other similar statistics demonstrates that this has a low impact on the aggregate series.

For further information, please see [Data limitations and revisions \(/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-22-may-2021#data-limitations-](#)

[and-revisions](#)).

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## Coherence

There are differences between these estimates and similar statistics produced by the ABS. When compared to other ABS sources, the change in payroll jobs, change in wages paid and change in average weekly wage per job in these estimates may differ due to differences in the concepts, scope and methodology used. For example, these estimates:

- contain a combination of administrative data collected for taxation purposes from businesses, whereas other ABS data sources are compiled for the explicit purpose of producing statistics,
- exclude unreported cash in hand payments which may be included in household and business surveys,
- may include information relating a reference week, rather than a particular point in time,
- are not currently able to be adjusted with respect to seasonality, unlike other Labour Force releases, and
- provide a view of payroll jobs, whereas the Labour Force survey presents a view of employed persons. The difference being those people who hold more than one job at a time (i.e. secondary jobs).

For further information, please see [Differences to Labour Force employment statistics \(/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-22-may-2021#differences-to-labour-force-employment-statistics\)](#).

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## How data are released

All estimates are presented for weeks ending on a Saturday. Core estimates are released fortnightly on Tuesdays during the COVID-19 period (i.e. a 17-day time lag after the reference week). The ABS has worked to optimise both the timeliness and quality of these data, however revisions in subsequent releases are necessary. Please see [Data limitations and revisions \(/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-22-may-2021#data-limitations-and-revisions\)](#) for more information.

## Summary of outputs

The following core estimates are produced for each release:

- payroll jobs and total wages, presented as indexes and percentage change movements, and
- average weekly wages per payroll job, for selected characteristics.

Other than indicative numbers on changes in jobs between March and the current period,

levels for jobs and wages are not available for release. The payroll jobs index provides a measure of changes in jobs over time since the week ending 14 March 2020. Information on levels for jobs is best sourced from estimates of filled jobs from [Labour Account Australia \(https://www.abs.gov.au/statistics/labour/employment-and-unemployment/labour-account-australia/latest-release\)](https://www.abs.gov.au/statistics/labour/employment-and-unemployment/labour-account-australia/latest-release) and estimates of employed persons from [Labour Force, Australia \(https://www.abs.gov.au/statistics/labour/employment-and-unemployment/labour-force-australia/latest-release\)](https://www.abs.gov.au/statistics/labour/employment-and-unemployment/labour-force-australia/latest-release). More information is included in [Differences to Labour Force employment statistics \(/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-22-may-2021#differences-to-labour-force-employment-statistics\)](https://www.abs.gov.au/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-22-may-2021#differences-to-labour-force-employment-statistics).

Estimates are available at the national, state and territory and [Australian and New Zealand Standard Industry Classification \(ANZSIC\) \(https://www.abs.gov.au/ausstats/abs@.nsf/mf/1292.0\)](https://www.abs.gov.au/ausstats/abs@.nsf/mf/1292.0) division by selected personal attributes, including sex and 10 year age group.

[Australian Statistical Geography Standard \(https://www.abs.gov.au/websitedbs/d3310114.nsf/home/australian+statistical+geography+standard+\(asgs\)\)](https://www.abs.gov.au/websitedbs/d3310114.nsf/home/australian+statistical+geography+standard+(asgs))) sub-state regions (Statistical Area 4 and Statistical Area 3) and ANZSIC sub-division estimates are updated on alternate releases for payroll jobs only. These estimates are published the day after the main release.

## Time series estimates

The estimates are presented as an original series only. Seasonally adjusted and trend estimates are not yet available. A number of years of data will be required before seasonal patterns can be observed and adjusted for.

The calendarisation and imputation methodologies applied to the estimates account for calendar related variations, such as the number of days in a month, and different payment frequencies.

## Revisions

The data underlying these estimates are revised for each release and reflected in percentage change movements and indexes. Please see [Data limitations and revisions \(/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-22-may-2021#data-limitations-and-revisions\)](https://www.abs.gov.au/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-22-may-2021#data-limitations-and-revisions) for more detail.

## Privacy and confidentiality

Legislative requirements to ensure privacy and secrecy of this data have been adhered to. In accordance with the Census and Statistics Act 1905, results have been confidentialised to ensure that they are not likely to enable identification of a particular person or organisation.

All personal information is handled in accordance with the Australian Privacy Principles contained in the Privacy Act 1988. For more information, see [ABS Privacy \(https://www.abs.gov.au/websitedbs/d3310114.nsf/home/privacy?opendocument\)](https://www.abs.gov.au/websitedbs/d3310114.nsf/home/privacy?opendocument).

## More information

For more information on this methodology please email [labour.statistics@abs.gov.au](mailto:labour.statistics@abs.gov.au) (<mailto:labour.statistics@abs.gov.au>).

## Methods review

As part of the transition of the Weekly Payroll Jobs and Wages series from a temporary COVID-19 product to an ongoing ABS output, the ABS are reviewing the methods and refreshing the data sources supporting these estimates. The ABS is currently investigating methods to improve the quality of payroll job and jobholder characteristics variables: Age; gender; industry; employment size; and geography.

In the coming months, the ABS will be progressively implementing updated methods which may result in a refresh of existing characteristics values and the population of 'unknown' values.

A regular refresh of the data sources, which support the determination of characteristics variables in these estimates, will also be established to maintain the currency and relevance of these data. As updated methods are implemented, more information will be provided here or in [How data are processed \(/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-22-may-2021#how-data-are-processed\)](/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-22-may-2021#how-data-are-processed) and [Data limitations and revisions \(/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-22-may-2021#data-limitations-and-revisions\)](/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-22-may-2021#data-limitations-and-revisions).

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## Update of jobholder characteristics

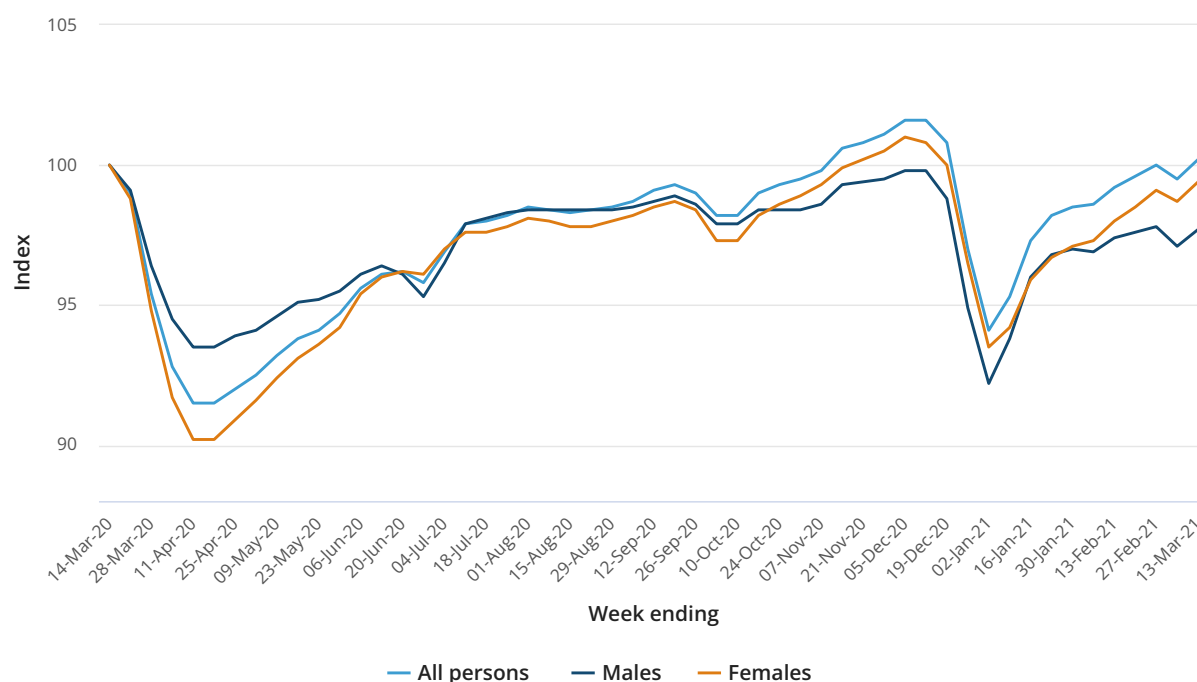
Jobholder characteristics presented in these estimates are sourced from both STP and ATO Client Register data. While the STP data set is a dynamic data source, the Client Register is a point in time snapshot of data. Prior to the release for the week ending 27 March 2021, the Client Register snapshot used was from mid-2019.

STP records whose characteristics cannot be determined from STP or the Client Register snapshot are assigned to an 'unknown' category. Records with unknown characteristics are included in the calculation of index totals (for payroll jobs and total wages), but are excluded from the component indexes (such as males and females). As persons join the workforce or register with the ATO for the first time, the Client Register snapshot becomes outdated and

the number payroll jobs with unknown characteristics increases.

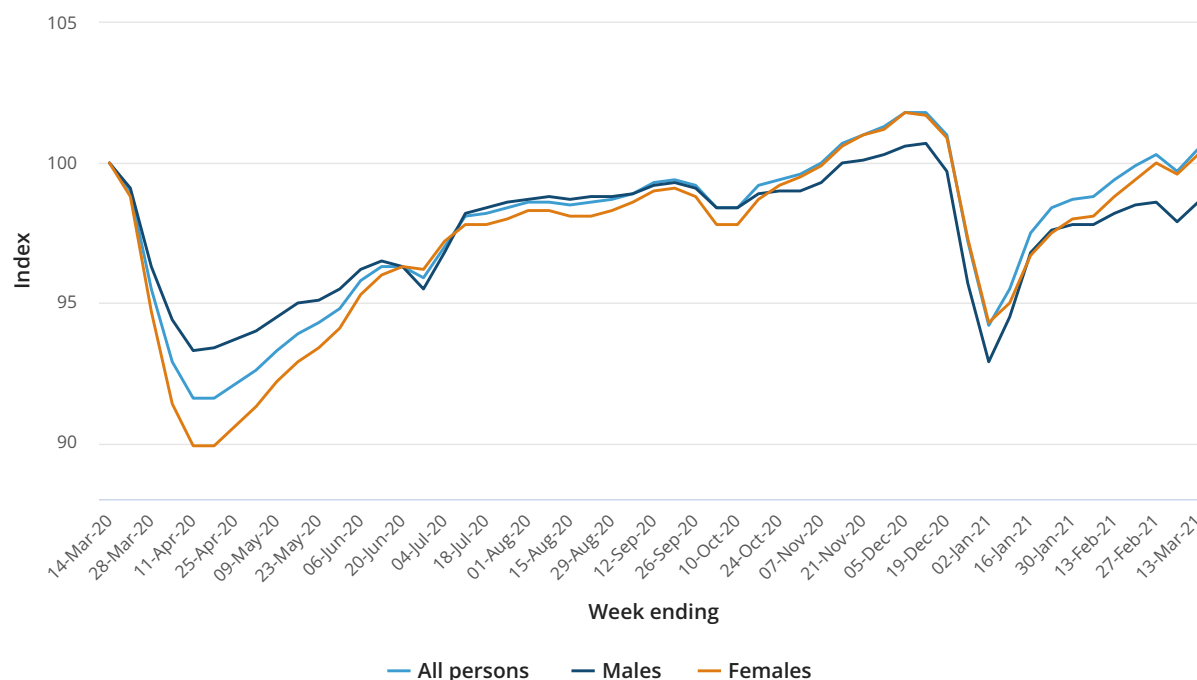
The effect of an increasing number of unknowns is visible in the divergence of the male and female payroll jobs indexes from the all persons payroll jobs index as released on 30 March 2021 for the week ending 13 March 2021.

Graph 3 - Payroll jobs by sex, 2019 Client Register source



From the release of week ending 27 March 2021, a mid-2020 snapshot of the Client Register has been used to update jobholder characteristics. The number of records with unknown characteristics has been reduced, in addition to some existing values being updated, causing varying levels of revision across the time series. Adjusted male and female payroll jobs indexes (as released on 30 March 2021 for the week ending 13 March 2021) after the Client Register update are presented below for comparison to the above graph.

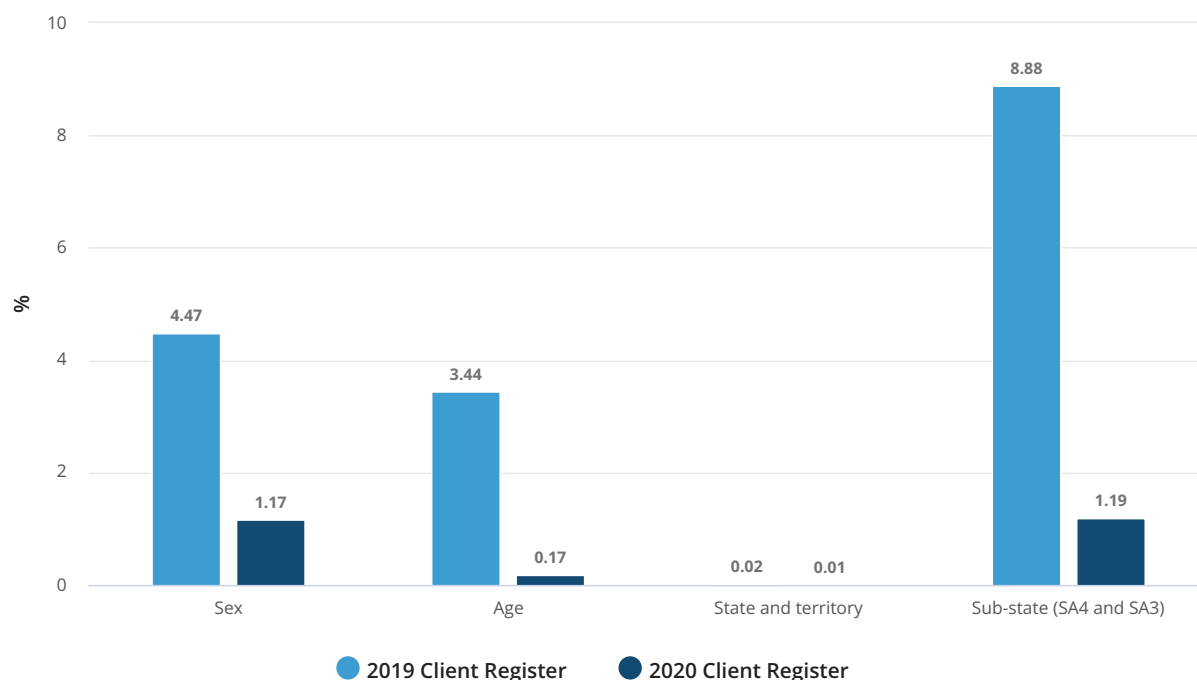
Graph 4 - Payroll jobs by sex, 2020 Client Register source



Jobholder characteristics, such as date of birth, sex and geography (including sub-state region) were updated using the mid-2020 snapshot and are held constant across the time series, to enable the change in payroll jobs and wages information to be produced without the volatility in characteristics. Age continues to be updated based on the job holders date of birth (see the Age derivation update section in [Methods Review \(/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-22-may-2021#methods-review\)](#) for more information). Total payroll jobs and wages indexes were not impacted by the Client Register update.

The level of revision seen in component indexes can be higher for some jobholder characteristics and can vary across the time series or the index of interest. The impact of revisions will be relative to the proportion of unknowns for those characteristics, as detailed in the table below.

Graph 5 - Proportion of unknown jobholder characteristics at week ending 13 March 2021



The proportion of unknown sex, which is only sourced from the Client Register, is expected to increase over time as the Client Register snapshot ages. Proportions of unknown age and geography remain small over time, as they can also be derived from STP data.

The Client Register snapshot used in these estimates, will be updated on at least an annual basis. The ABS is currently investigating suitable timing and frequency of future Client Register updates.

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## Imputation update

As part of the ongoing methods review, the imputation method was reviewed and updated in the release of 16 February 2021 (for the week ending 30 January 2021). Imputation is used to estimate values for incomplete data in the most recent pay period, to account for different payment frequencies and business reporting patterns. For more information on how imputation is applied, see the Imputation section of [How data are processed \(/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-22-](/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-22-)



[may-2021#how-data-are-processed](#)).

The imputation method uses a derived 'final pay frequency' (based on reported pay events in the STP data) to determine which pay events will be imputed. In the previous method, the final pay frequency was the mode frequency of the three largest pay events of a payroll job. Investigations determined that this method did not impute pay events where a mode could not be calculated.

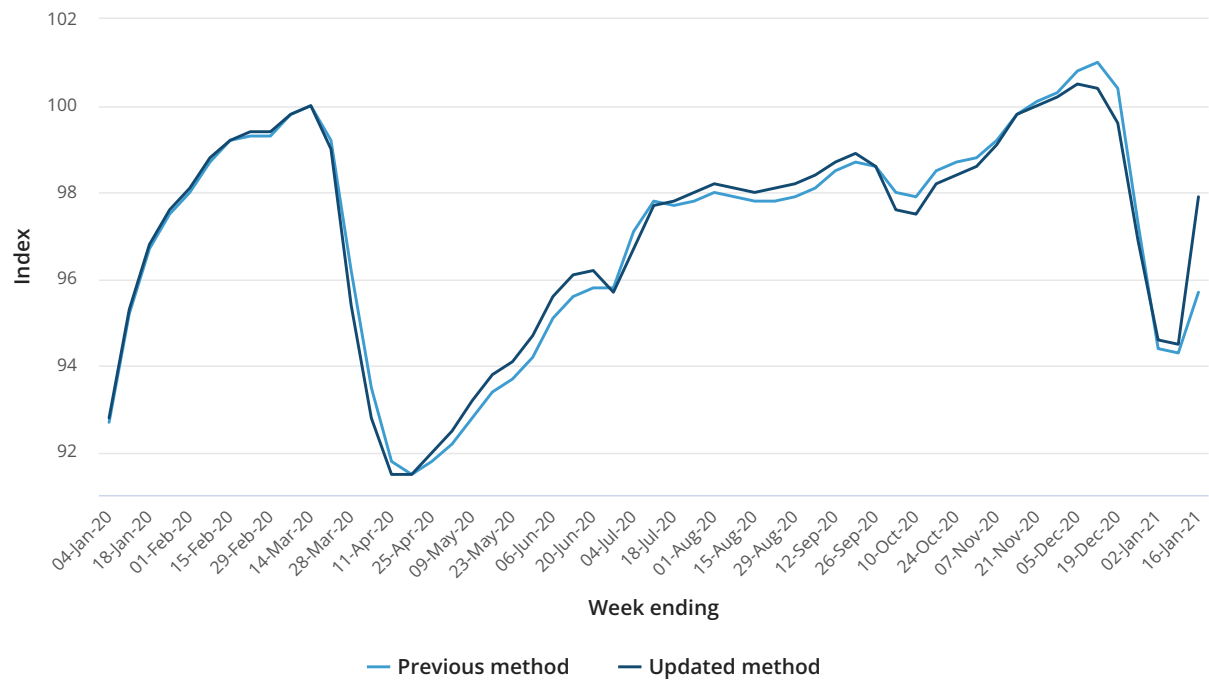
The updated method seeks to optimise the number of pay events imputed, while ensuring that imputation is not applied continuously. This is achieved by:

- determining final pay frequency based on the mode of the three most recent pay events, using the median pay frequency if the mode cannot be determined; and
- removing imputation when subsequent business reporting indicates that imputation is not required.

Across the time series, all indexes (including component indexes) are affected by the updated method. The updated imputation method has been applied across all historical data, resulting in revisions across the time series. Revisions may be more pronounced in finer component indexes, such as state by industry. The ABS recommends that analyses of previously published estimates be refreshed with data from this release.

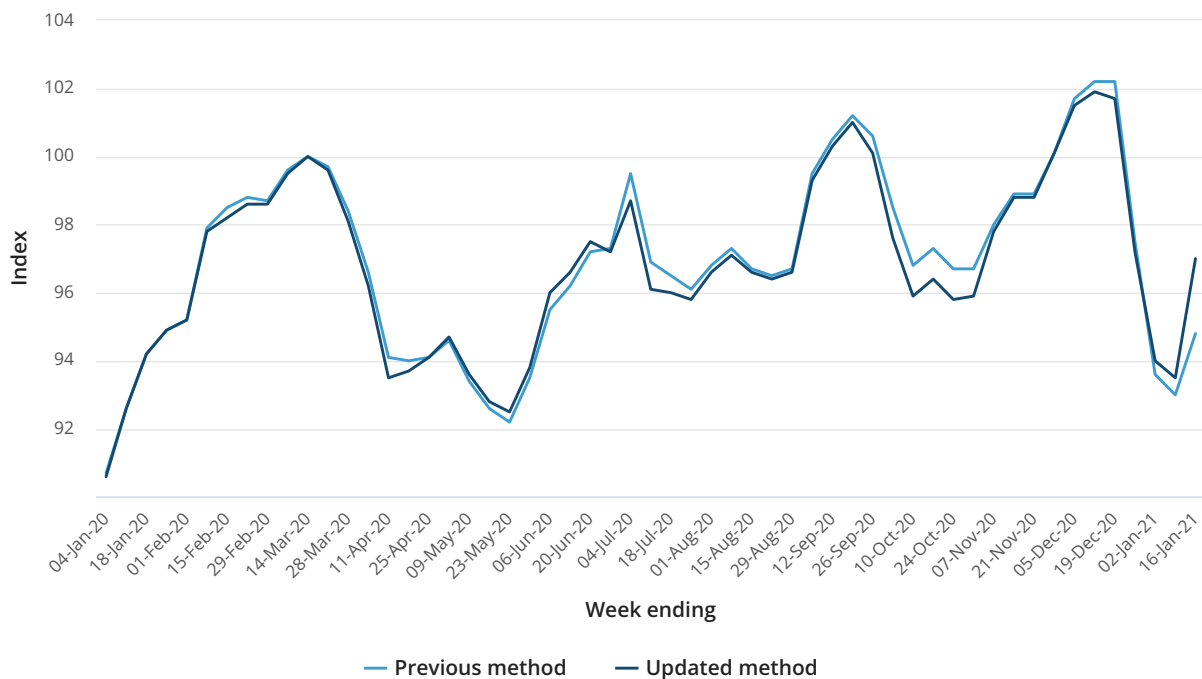
The updated method is designed to deliver a reduced magnitude of future revisions, particularly in the most recent week's data. The following graphs present separate comparisons of payroll jobs and wages, using the updated and previous methods against data as released on 2 February 2021 for the week ending 16 January 2021.

Graph 6 - Payroll jobs by imputation methods



Source: [Weekly Payroll jobs and Wages, Week ending 16 January 2021 \(/statistics/labour/earnings-and-work-hours/weekly-payroll-jobs-and-wages-australia/week-ending-16-january-2021\).](#)

Graph 7 - Total wages by imputation methods



Source: [Weekly Payroll Jobs and Wages, Week ending 16 January 2021 \(/statistics/labour/earnings-and-work-hours/weekly-payroll-jobs-and-wages-australia/week-ending-16-january-2021\)](#).

## Age derivation update

In line with the Methods review outlined above, an investigation of existing methods highlighted an issue with the derivation of age (and consequently age group indexes). The issue related to how age was determined with respect to the current reference week. For example, at the time of the first release on 21 April 2020, there were approximately 509,000 payroll jobs reported to be held by 15-19-year olds in the week ending 14 March 2020. As at the 19 January 2021 release, this cohort was estimated to contain 434,000 payroll jobs for the week ending 14 March 2020.

Previously, a person's age (and age group) was redefined at each reference week and updated to the start of the time series included in that release. This resulted in the age group population being measured in each reference week changing over time, and

becoming increasingly different to the population of interest. This issue particularly impacted the time series of the youngest (aged 15-19 years) and oldest (aged 70 years and over) persons age groups.

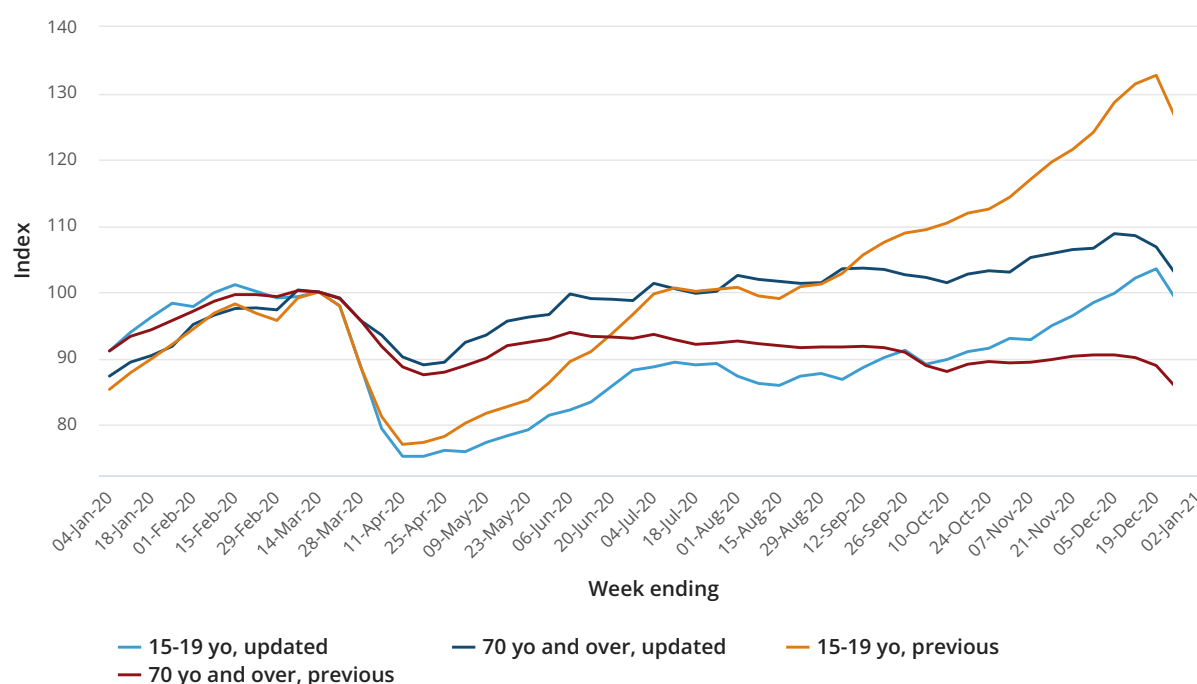
In the 2 February 2021 release, the derivation method was updated to: hold a person's age (and consequently age group) constant until their birthday month; and 'age' a person at the start of their birthday month. That is, at the start of each calendar month, the age of all job occupants with a birthday in the coming month will be updated to that of their upcoming birthday.

Privacy protection has been increased by using calendar month to update age, rather than the more precise day and month. However, it may introduce a small amount of volatility in the week on week change at the start of each calendar month. That is, a portion of the movement in age group at the start of the month (payroll jobs and wages) may relate to the 'aging' of persons as they transition up an age group.

Indexes for national, state/territory, industry and employment size estimates are not affected by the updated method, as only those indexes with an age dimension have been impacted.

A comparison of payroll jobs is presented in the following graph for the age groups most affected by the change in method, using data from the 2 February 2021 release.

Graph 8 - Payroll jobs by selected age groups by age derivation methods



Source: [Weekly Payroll Jobs and Wages, Week ending 16 January 2021 \(/statistics/labour/earnings-and-work-hours/weekly-payroll-jobs-and-wages-australia/week-ending-16-january-2021\)](#).

## Data limitations and revisions

Weekly Payroll Jobs and Wages in Australia estimates are derived from data collected via the STP system, which effectively supports employer reporting obligations and ATO operational requirements through enabled software. However, it is not primarily designed to support the production of statistics and therefore some inherent limitations of the data require specific treatment and result in data revisions between statistical publications.

The weekly change estimates for the most recent weeks of data contain a higher degree of reporting variability and imputation (described further below). The ABS recommends that users exercise caution when focusing on change in the most recent weeks, as these estimates are subject to a greater levels of revision in subsequent releases.

As the compilation of these estimates evolves, reporting patterns sometimes arise which require detailed analysis and treatment. Outcomes from these analyses may result in changes to methodology or revisions to data which will be updated here, as required.

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## Week on week revisions

Payroll jobs and wages estimates (including percentage change movements and indexes) are revised in each release across the time series. These revisions arise from:

- the aim to release data as close as possible to the period when the activity occurred,
- the receipt of more complete STP data over time,
- the incorporation of newly available businesses in STP reported data.

Revisions have the greatest impact on the most recently reported information. Over time, as more business-reported data is received, the size of revisions decreases. To reduce the impact of week on week revisions, the ABS uses historical information to impute the most recent weeks data. The ABS is taking a cautious approach to imputation as factors influencing jobs can occur unexpectedly, for example, the surge in COVID-19 cases in Victoria in July 2020.

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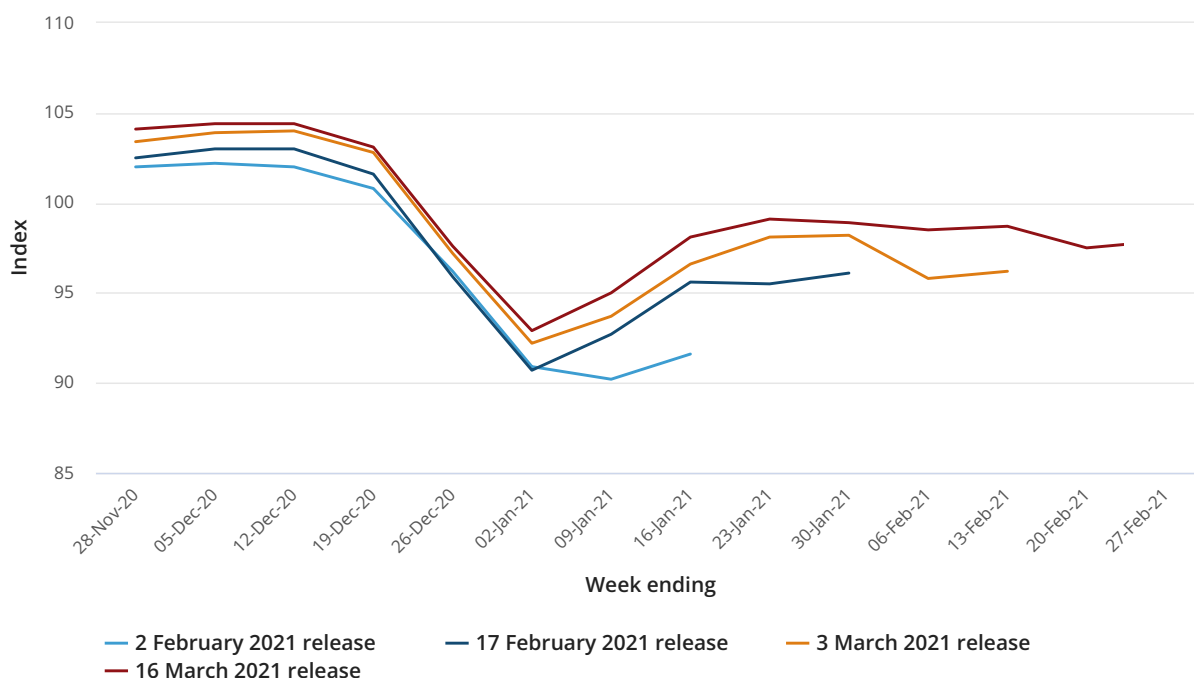
## Variation in revisions

The size of revisions and the period over which they apply can vary between indexes. Some component indexes are subject to higher than usual levels of revision, over a longer period. For example, the employment size indexes show both a higher incidence and duration of revision. This is most noticeable in the small employers group (those with under 20 employees). The following characteristics of this group contribute to the variation in revision of their estimates:

- higher levels of reporting variability;
- a greater incidence of longer payment periods (such as quarterly); and
- graduated STP onboarding.

The following graph presents data from consecutive releases to highlight the impact of revisions for this cohort (as applied in consecutive releases).

**Graph 9 - Revision of payroll jobs index for Under 20 employment size, for selected releases**



The ABS is currently investigating methods to reduce the future level of revisions in this series.

In the 28 April 2021 release, the period over which historical imputation (for employees assumed to be terminated) is removed was changed to better account for lags in business reporting and differing pay frequencies. Previously, if an employee received no payment after 3 pay periods, historical imputation was removed for the previous 2 pay periods. From this release, while forward imputation still ends after 3 pay periods, the imputed data remains in place for 8 pay periods. This method change has resulted in the reinstatement of some imputation in earlier time periods, causing differing levels of revision in the time series although week on week change remains similar. Some component indexes (such as industry) may see greater variation in revisions at different time points due to the contribution of dominant pay frequencies. For more information on the dominant pay frequency of industries, see the Imputation section of [How data are processed \(/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-22-may-2021#how-data-are-processed\)](#).

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## Incorporating new employer reported data

As new businesses commence reporting through STP, the ABS determines when the business appears in the dataset for the first time and distributes the year to date jobs and wages across all past payment periods for the current financial year. This ensures that weekly estimates best reflect change in the labour market over time through payment activities, rather than changes in the uptake of STP reporting by the businesses. This approach necessitates revisions across the time series. From the 19 January 2021 release, the method used to backcast data for new reporters was adjusted to ensure that it better reflects when wages were actually paid.

Similarly, there can be a delay for new employees to appear in the STP data. By analysing the data over time, the ABS determined that a coverage adjustment was needed. This adjustment is only applied to the last week of estimates in each release.

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## Reporting variability

Wage estimates are subject to a higher degree of reporting variability (due to seasonal variation in payments, changes in working hours and overtime) and revisions than the payroll jobs estimates. While the ABS accounts for employees being paid with different frequencies (weekly, fortnightly etc.) there are points in the year when additional reporting activity is more common, which may flow through to published estimates.

Reduced wages which are observed through May 2020 (and are more pronounced in COVID-19 impacted industries) may reflect a combination of:

- reduced wages being paid by COVID-19 affected employers, who may also have reduced hours over the period - particularly for jobs that weren't eligible for JobKeeper support,
- seasonal changes in wages (including bonus payments), and
- potential payroll reporting changes for some employers during May 2020. This could include changes to payment frequency or payment categorisation, both of which could affect the imputation methodology and how payments are effectively apportioned onto an accruals basis.

The first 'JobKeeper' payments were received by employers in the first week of May 2020. JobKeeper monies paid to employees through STP-enabled payrolls are incorporated into the wages index. Further information on the treatment of JobKeeper in ABS economic statistics can be found in [Economic measurement during COVID-19: Selected issues in the Economic Accounts, May 2020 \(https://www.abs.gov.au/ausstats/abs@.nsf/mf/5261.0?OpenDocument\)](https://www.abs.gov.au/ausstats/abs@.nsf/mf/5261.0?OpenDocument).



The dynamic nature of STP data can result in revisions to payroll jobs and wages indexes, caused by the re-submission of payroll data for historical pay periods (including prior financial years) by STP-enabled businesses. When re-submission results in an update to payroll jobs and wages levels at the index base reference period (of 14 March 2020), a revision across the index time series in component indexes may be observed.

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## Seasonality

These estimates are presented as an 'original' data series, and do not include seasonally adjusted or trend data time series found in other labour statistics releases (e.g. Labour Force).

STP is a relatively new program (and data source). Generally, three to five years of data are required before good seasonally adjusted data can be produced, hence it is not yet possible to produce a seasonally adjusted series (with seasonal elements removed) or trend series (with both the seasonal elements and irregular fluctuations removed). This means that variations in these estimates may reflect COVID-19 related impacts in the economy in addition to seasonal changes in the labour market.

Seasonal characteristics which may be observed include effects seen:

- around national public holidays, where increases in the total wages series are seen in industries where penalty rates are paid;
- ahead of the Christmas period, where considerable labour market activity in a range of industries increases payroll jobs and wages,
- across school holiday periods, where some industries experience lower business activity. This is particularly pronounced in the holiday period after Christmas, resulting in a decrease in the national payroll jobs and total wages series,
- in industries where periodic bonuses are paid. While bonuses may be paid at any time during the year, they often have an industry pattern. For example, the effect of bonus payments are seen in March and September in both the Mining and Financial and insurance services industries total wages series.

As seasonal characteristics are further identified in these data, this list will be expanded.

### **Agriculture, forestry and fishing industry**

The Agriculture, forestry and fishing industry is subject to higher rates of week-on-week change in the payroll jobs and wages series than other industries. This is primarily due to greater peaks and troughs caused by seasonal factors that affect employment such as harvesting or shearing. Employers in this industry have also had STP reporting concessions which permit them to report on a less frequent basis than each pay event. These concessions will cease at the end of June 2021.

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## Data components, totals and index calculation

STP data is linked to other information held by the ABS to derive demographic and business characteristics such as age group, sex, geography and industry. If a specific characteristic cannot be linked or derived, and does not appear on the STP file, it is assigned an 'unknown' category (for that characteristic).

Records with 'unknown' characteristics are included in the calculation of index totals for that category. As 'total' and 'component' indexes are calculated independently, the inclusion of records with 'unknown' characteristics in a 'total' index can result in independent movement from 'component' indexes. For example, the 'total' index of Persons is calculated from the combined levels of Males, Females and 'unknown' (persons for whom a Male/Female sex cannot be determined). As a result, the Persons index can move independently from Male and Female indexes, which do not include 'unknown' persons. While the proportion of unknown characteristics vary by characteristic, their impact will be compounded in components of finer indexes (such as in State and territory by sex by age group).

Since the 19 January 2021 release, business data with an 'unknown' industry characteristics have been included in all index calculations (with the exception of industry indexes as the characteristic is 'unknown'). These data were previously excluded from the total payroll jobs and total wages time series.

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## Hours worked, job attachment and employment status

STP data does not include information on hours worked or hours paid for. Analysis of monthly hours worked can be found in [Labour Force, Australia \(https://www.abs.gov.au/statistics/labour/employment-and-unemployment/labour-force-australia/latest-release\)](https://www.abs.gov.au/statistics/labour/employment-and-unemployment/labour-force-australia/latest-release), and [Labour Force, Australia, Detailed \(https://www.abs.gov.au/statistics/labour/employment-and-unemployment/labour-force-australia-detailed/latest-release\)](https://www.abs.gov.au/statistics/labour/employment-and-unemployment/labour-force-australia-detailed/latest-release). STP data are also unable to account for job attachment where a payment has not been made, where a jobholder was temporarily stood down without pay.

The estimates do not include information on the employment status of employees, i.e. full time or part time. This will be explored as part of ongoing work between the ABS and the ATO. In the interim, this information is also available within the suite of Labour Force releases.

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## Acknowledgement of source

STP data is supplied by the ATO to the ABS under the Taxation Administration Act 1953, which requires that such data is only used for the purposes of administering the Census and Statistics Act 1905. Any discussion of data limitations or weaknesses is made within the context of using the data for statistical purposes, and is not related to the ability of the data to support the ATO's core operational requirements.

These estimates also include Australian Business Register (ABR) data supplied by the Registrar to the ABS under A New Tax System (Australian Business Number) Act 1999, which requires that such data is only used for the purpose of carrying out functions of the ABS. Any discussion of data limitations or weaknesses is in the context of using the data for statistical purposes, and is not related to the ability of the data to support the ABR's core operational requirements.

The ABS would like to acknowledge the critical support from the Australian Taxation Office (ATO) in enabling the ABS to produce these statistics.

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## Differences to labour force employment statistics

Weekly Payroll Jobs and Wages in Australia are experimental estimates, compiled in near real time and published fortnightly. This information provides a complementary insight to Labour Force statistics on employment, which provide a more comprehensive view of the Labour market.

The differences in concepts, scope and methodology used to produce changes in employment (as reported in Labour Force statistics) and changes in payroll jobs can affect their interpretation as economic measures. The following key differences should be considered when comparing these statistics.

|                         | Weekly Payroll Jobs and Wages in Australia   | Labour Force statistics   |
|-------------------------|--|---|
| Focus of the statistics | Payroll jobs.  | People.   |
| Types of employment     | Payroll jobs for which a payment was reported to the ATO through STP.<br><br>Excludes:<br>Owner managers of unincorporated enterprises;<br>Owner managers of incorporated enterprises where they are not paid through a STP reported payroll;<br>Contributing family workers where they are not paid through a STP reported payroll. | All employed people, including:<br>Employees (including Owner managers of incorporated enterprises);<br>Owner managers of unincorporated enterprises;<br>Contributing family workers. |

| Weekly Payroll Jobs and Wages in Australia |  | Labour Force statistics  |
|--|--|--|
| <b>Whether paid</b>                        | Only includes payroll jobs for which a payment was reported to the ATO through STP or there is an established payment pattern. | Includes all employed people who were paid or who had a job but weren't paid (on unpaid leave, temporarily stood down without pay, etc). |
| <b>Multiple job holding</b>                | Each job is counted separately, irrespective of whether it is worked by a multiple jobholder.                                  | Around 6% of employed people are multiple jobholders, particularly young people.   |

Recently released Labour Force analysis of employment versus payroll jobs up to August 2020 can be found in [Strong employment growth for non-employees \(/articles/strong-employment-growth-non-employees/\)](/articles/strong-employment-growth-non-employees/). More information on the coherence of Weekly Payroll Jobs and Wages estimates with similar ABS statistics are detailed in the Coherence section of [How data are processed \(/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-22-may-2021#how-data-are-processed/\)](/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-22-may-2021#how-data-are-processed/).

## History of change

A timeline of recently implemented methodological changes are listed below for easy reference.

### By release date

Week ending 10 April 2021

- [Historical imputation \(/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-10-april-2021#how-data-are-processed/\)](/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-10-april-2021#how-data-are-processed/) - period over which historical imputation is removed for terminated employees changed from 3 to 8 pay periods.

Week ending 27 March 2021

- [Update of jobholder characteristics \(/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-27-march-2021#methods-review/\)](/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-27-march-2021#methods-review/) - Client Register snapshot update to sex, age and geography variables

Week ending 30 January 2021

- [Imputation update \(/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-30-january-2021#methods-review/\)](/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-30-january-2021#methods-review/) - to deliver a reduced magnitude of future revisions, particularly in the most recent week's data

Week ending 16 January 2021

- [Age derivation update \(/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-16-january-2021#data-limitations-and-revisions\)](/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-16-january-2021#data-limitations-and-revisions) - a person is aged at the start of their birthday month instead of redefining age each reference week

Week ending 2 January 2021

- Update of characteristics variables - Employers with unknown industry included in estimates, as noted in [Data limitations and revisions \(/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-2-january-2021#data-limitations-and-revisions\)](/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-2-january-2021#data-limitations-and-revisions)

Week ending 14 November 2020

- [Week on week revisions \(/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-14-november-2020#data-limitations-and-revisions\)](/methodologies/weekly-payroll-jobs-and-wages-australia-methodology/week-ending-14-november-2020#data-limitations-and-revisions) - persons aged 15 years excluded from the under 20s age group

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## Glossary

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### Show all

#### Accrual basis

Recording wages when they are earned, accrued or incurred regardless of when payment is made or received.

#### Australian Bureau of Statistics Business Register

A register of all Australian businesses and organisations maintained by the Australian Bureau of Statistics (ABS) for the purpose of producing statistical frames and business demography outputs. It contains identifying and classificatory data for each business and organisation.

Information to populate the ABS Business Register is largely sourced from the Australian Business Register.

The ABS Business Register consists of two subpopulations, the profiled population and the non-profiled population. The ABS Business Register uses an economic units model to describe the characteristics of businesses and the structural relationships between related businesses.

#### Australian Business Number

A unique identifier. To be entitled to an Australian Business Number (ABN), an organisation must be one or more of the following:

- a company registered under the Corporations Act 2001
- an entity carrying on an enterprise in Australia
- a government entity
- a non-profit sub-entity for Goods and Services Tax purposes
- a superannuation fund.

A non-resident entity may be entitled to an ABN if they are carrying on an enterprise in Australia and/or, in the course of carrying on an enterprise, the entity makes sales that are connected with Australia.

### **Australian Business Register**

The data store containing details about businesses and organisations that have registered for an Australian Business Number. More information can be found on the [ABR website \(https://abr.gov.au/\)](https://abr.gov.au/).

### **Australian Tax Office person-level Client Register**

A register of persons that have interacted with the Australian Tax Office (ATO) and have been issued with an Australian Tax File Number (TFN). The ATO person-level Client Register comprises demographic information such as sex, date of birth, and residential address.

### **Cash basis**

Recording the wage payment in the pay period when the payment was received by the employee.

### **Commencement and termination dates**

Commencement and termination dates associated with each job as reported through Single Touch Payroll.

### **Employee**

Persons who work for a private or public sector employer, where the employee has received payment in the reference week through Single Touch Payroll (STP) enabled software and reported to the Australian Taxation Office (ATO).

### **Employer**

An organisation with an Australian Business Number that provides employment income to one or more people, and reports through the ATO STP system.

## Geography

Based on residential address as sourced from either the ATO Client Register or STP data. See also Statistical area entries. For more information, see the [Australian Statistical Geography Standard \(ASGS\): Volume 1 – Main Structure and Greater Capital City Statistical Areas \(https://www.abs.gov.au/AUSSTATS/abs@.nsf/ProductsbyCatalogue/871A7FF33DF471FBCA257801000DCD5F?OpenDocument\)](https://www.abs.gov.au/AUSSTATS/abs@.nsf/ProductsbyCatalogue/871A7FF33DF471FBCA257801000DCD5F?OpenDocument).

## Industry

A homogenous grouping of economic activities undertaken to produce goods and services. The [Australian and New Zealand Standard Industrial Classification \(https://www.abs.gov.au/ausstats/abs@.nsf/mf/1292.0\)](https://www.abs.gov.au/ausstats/abs@.nsf/mf/1292.0) is used to classify an entity to an industry based on its dominant activity.

## Industry division

The broadest grouping of industries within the Australian and New Zealand Standard Industrial Classification. The main purpose of the industry division level is to provide a limited number of categories, which give a broad overall picture of the economy. There are 19 mutually exclusive divisions. For more information see the [Australian and New Zealand Standard Industrial Classification \(https://www.abs.gov.au/ausstats/abs@.nsf/mf/1292.0\)](https://www.abs.gov.au/ausstats/abs@.nsf/mf/1292.0).

## Industry subdivision

The second broadest grouping of industries within the Australian and New Zealand Statistical Industrial Classification. Industry subdivisions are built up from the industry groups which, in turn, are built up from industry classes. For more information see the [Australian and New Zealand Standard Industrial Classification \(https://www.abs.gov.au/ausstats/abs@.nsf/mf/1292.0\)](https://www.abs.gov.au/ausstats/abs@.nsf/mf/1292.0).

## Job

See payroll job.

## Not available (NA)

Statistic is not available. This can be to protect the confidentiality of data providers or to prevent misinterpretation of statistics due to poor quality.

## Owner-manager of unincorporated enterprises (OMUE)

A person who operates their own unincorporated enterprise, which does not possess a separate legal identity to that of its owner(s), or engages independently in a profession or trade.

OMUEs can also be referred to as self-employed. Owner managers of unincorporated enterprises are not included in these estimates as they are not in scope of STP-enabled software reporting to the ATO.

Unincorporated enterprises are further defined in the [Standard Economic Sector Classifications of Australia \(https://www.abs.gov.au/ausstats/abs@.nsf/mf/1218.0\)](https://www.abs.gov.au/ausstats/abs@.nsf/mf/1218.0).

## **Payroll job**

A payroll job is a relationship between an employee and their employing enterprise, where the employee is paid in the reference week through STP-enabled payroll or accounting software and reported to the ATO. Where an employee is paid other than weekly, the established payment pattern is used to identify jobs in weeks outside the payment week.

## **Single Touch Payroll**

The Single Touch Payroll (STP) system sends taxation and superannuation information from a business' STP-enabled payroll or accounting software to the ATO as a business runs its payroll.

## **Sex**

Self reported sex (i.e. male/ female) of a person as reported through the ATO taxation system. Categories other than male or female are not published separately in this release but are included in published totals.

## **Statistical area level 3**

Statistical area level 3 (SA3) regions are designed to provide a regional breakdown of Australia. They generally have a population of between 30,000 and 130,000 people. In regional areas, SA3s represent the area serviced by regional cities that have a population over 20,000 people. In the major cities, SA3s represent the area serviced by a major transport and commercial hub. They often closely align to large urban Local Government Areas (e.g. Gladstone, Geelong). In outer regional and remote areas, SA3s represent areas which are widely recognised as having a distinct identity and similar social and economic characteristics.

## **Statistical area level 4**

Statistical area level 4 (SA4) regions are specifically designed to reflect labour markets within each state and territory within population limits. In regional areas, SA4s tend to have lower populations (100,000 to 300,000), while in metropolitan areas, SA4s tend to have larger populations (300,000 to 500,000).

## **Type of activity unit**



The statistical unit for more significant and diverse businesses in the profiled population. A type of activity unit (TAU) is a constructed unit that can practically group and report on homogenous production activities at the industry sub-division level.

In this publication, the TAU is used to represent employers in the profiled population.

### **Type of legal organisation**

All legal entities on the ABS Business Register are classified according to their type of legal organisation, of which there are three types:

- incorporated private sector entities
- unincorporated private sector entities
- public sector entities.

The type of legal organisation indicates whether a business is part of the private or public sector and the type of ownership structure. For more information see the [Standard Economic Sector Classifications of Australia \(https://www.abs.gov.au/ausstats/abs@.nsf/mf/1218.0\)](https://www.abs.gov.au/ausstats/abs@.nsf/mf/1218.0).

### **Wages**

Wages include salary payments and allowances, labour hire payments and foreign income, as well as the value of payments in kind (where a fringe benefit amount is recorded). Bonuses are typically included where they are reported in the same field as normal payments. Wages are calculated as gross amounts, prior to taxation and deductions.

Wages exclude payments to employee's superannuation as well as severance and termination payments. Wages are only available for payroll jobs and do not include income from own businesses or other sources.

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## **Abbreviations**

|               |   |
|---------------|---|
| <b>ABN</b>    | Australian Business Number                                    |
| <b>ABR</b>    | Australian Business Register                                  |
| <b>ANZSIC</b> | Australian and New Zealand Standard Industrial Classification |
| <b>ASGS</b>   | Australian Statistical Geography Standard                     |
| <b>ATO</b>    | Australian Taxation Office                                    |
| <b>FBT</b>    | fringe benefits tax   |
| <b>NA</b>     | Not Available   |
| <b>pts</b>    | Index points  |
| <b>SA3</b>    | Statistical Area Level 3                                      |
| <b>SA4</b>    | Statistical Area Level 4                                      |
| <b>STP</b>    | Single Touch Payroll  |
| <b>TFN</b>    | Tax File Number   |